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TRENDS IN NEIGHBORHOOD INCOME INEQUALITY IN THE U.S.: 1980–2000*

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ABSTRACT. This paper reports evidence on the geographic pattern of income inequality, both within and between neighborhoods, across a sample of 359 U.S. metropolitan areas between 1980 and 2000. The results indicate that overall income inequality within a metro area tends to be driven by variation within neighborhoods, not between them, although we find that between-neighborhood differences rose dramatically during the 1980s and subsided somewhat during the 1990s. While this trend is similar to what existing research has found, our findings reveal potentially important differences in the magnitudes of the changes depending on whether neighborhoods are defined by block groups or tracts.

1. INTRODUCTION

Over the past three decades, income inequality has risen dramatically in the U.S. Figures reported by the U.S. Census Bureau, for example, indicate that the variance of the log household income distribution increased by nearly 25 percent between 1970 and 2000.[1] The rather striking nature of this rise has, of course, attracted a sizable literature, which has both documented many of the trends and offered a variety of possible explanations.[2]

What this research has not done, for the most part, is explore the residential aspects of this trend. That is, most of the existing inequality literature has not looked at whether the growth of income dispersion has been accompanied by increasing residential segregation by income. In light of the significance of neighborhood-level influences (including the income of one's neighbors) on a

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[1]These numbers are available at http://www.census.gov/hhes/income/histinc/ie6.html.

[2]A brief sampling of the literature appears in the next section.

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variety of economic behaviors and outcomes, we believe that income segregation across residential areas is an issue that deserves considerable study.[3]

This paper offers a purely empirical look at some trends in neighborhood-level income inequality, defined by the variation exhibited by average log household incomes among a collection of roughly 165,000 block groups and 50,000 tracts in 359 U.S. metropolitan areas, over the years 1980, 1990, and 2000. In particular, our interest is focused on documenting the evolution of income dispersion both within these neighborhoods as well as between them. Our primary results can be described as follows.

First, the majority of income inequality is associated with inequality within block groups and tracts, not between them. In each year, more than 75 percent of a typical metropolitan area's income variation can be linked to variation among households living in the same block group. When examining tracts, more than 80 percent can be tied to within-neighborhood income differences.

Second, between 1980 and 2000, income inequality increased both between neighborhoods and within them. On average, metropolitan areas experienced a 10-log point increase in the variance of their household income distributions over these two decades. Within- and between-block group variation increased by, respectively, 5 and 6 log points whereas within- and between-tract variation increased by, respectively, 8 and 2 log points.

Third, the decade of the 1980s saw a particularly large rise in the degree of inequality between different neighborhoods, especially block groups. The fraction of the average metropolitan area's total income variance attributable to between-block group differences in average incomes rose from 13 percent to 21 percent during this decade. Between-tract differences rose from 13 percent of total income variation in 1980 to 16 percent in 1990. Both figures, however, decreased slightly between 1990 and 2000.

Given the concern that many researchers have expressed over widening income differentials between residential areas, our results suggest two primary conclusions. First, to the extent that block groups are more relevant for understanding neighborhood-level interactions and spillovers than tracts, our results suggest that the problems associated with the residential segregation by income may have become even more severe for low-income households than previous estimates (i.e., those based on tracts) have indicated. Again, the rise in between-block group income differentials was, on average, three times larger than the rise in between-tract differentials over this 20-year period. Second, however, the massive run-up in segregation seen between 1980 and 1990 leveled off between 1990 and 2000. Hence, although income segregation across neighborhoods rose substantially between block groups (and to a lesser extent, tracts) between 1980 and 2000, the more recent trend has shown only modest changes in between-neighborhood differences.

[3]The literature on neighborhood effects, which have been shown to influence employment status, income, and criminal behavior among other outcomes, is quite extensive. See Durlauf (2004) for a survey.

The remainder of the paper proceeds as follows. The next section reviews some relevant literature in order to compare our contribution to that of previous work. Section 3 provides a brief description of the data and measurement techniques, particularly the decomposition of overall income variation into within- and between-neighborhood components. Section 4 describes the resulting measures. Section 5 concludes.

2. A BRIEF SURVEY OF RELATED RESEARCH

Much of the existing work on residential income inequality falls into one of two broad categories. The first considers the concentration of poverty, either between central cities and their surrounding suburbs (e.g., Mayer, 1996; Madden, 2000; Pack, 2002) or among neighborhoods, typically defined by Census tracts (e.g., Kasarda, 1993; Abramson et al., 1995). In general, these studies have found evidence that the poor became increasingly concentrated in the decades immediately following the late 1960s and early 1970s, at least within the largest cities and metropolitan areas in the country.

The second examines income differences either within or between residential areas (or both) defined either among small clusters of housing units (e.g., Hardman and Ioannides, 2004 and Ioannides, 2004) or larger, more traditionally defined neighborhoods such as Census tracts (e.g., Massey and Eggers, 1990; Jargowsky, 1996; Mayer, 2001; Yang and Jargowsky, 2006). Among other things, this literature finds significant income variation within residential areas. Indeed, in any given year, the majority of overall income inequality in a local market, such as a city or metropolitan area, tends to be associated with differences among households within neighborhoods rather than differences between them (i.e., segregation). Nevertheless, Jargowsky (1996) and Mayer (2001) find that segregation across Census tracts increased between 1980 and 1990, while Yang and Jargowsky (2006) report that it declined during the 1990s.

This paper is more closely aligned with this second literature. Indeed, we follow much the same methodological approach in estimating inequality both between and within neighborhoods as Jargowsky (1996). However, our focus is somewhat different. In particular, we are interested in documenting trends in each of three measures of income inequality—total, between-neighborhood, within-neighborhood—rather than a measure of segregation (usually computed as the ratio of between-neighborhood variation to total variation), and do so at both the block group and tract levels. Our overall aim, quite simply, is to augment the existing literature by highlighting some aspects of residential income inequality that, in our view, have not yet been sufficiently studied.

3. DATA AND MEASUREMENT

Data on household income at the block group and tract levels come from GeoLytics, who have compiled data from the 1980, 1990, and 2000 U.S. Census

of Population and Housing using fixed geographic definitions.[4] Hence, we are able to estimate mean household income within small neighborhoods whose boundaries are constant over time.

There are two fundamental geographic units that we consider: block groups and tracts. Block groups are the smaller of the two. Across the 359 metro areas in the sample, there are roughly 165,000 block groups that contained, on average, 526.5 households each and had a median land area of approximately 0.33 square miles in the year 2000. The sample also includes approximately 50,000 tracts, which, in 2000, averaged 1,648.8 households and had a median land area of 1.31 square miles.

Due to their smaller size, block groups are our preferred units of analysis. Neighborhoods, ideally, should capture spaces over which individuals can reasonably be expected to interact with one another. Clearly, this expectation is more likely to be satisfied among groups of 500 households spread out over a third of a square mile than an area more than three times as large.[5] Nevertheless, although we focus on block groups for much of the paper, we feel that, for the sake of comparison to the extant literature discussed above, it is appropriate to conduct the analysis on tracts as well.

We estimate the variance of a metropolitan area's income distribution as follows. For each year, the number of households with incomes falling into each of N closed intervals is reported.[6] We use these figures to compute the fraction of households with incomes less than N distinct quantities, which allow us estimate N quantiles of the household income distribution for each metro area. For example, if 14 percent of all households have income less than 25,000 dollars, we estimate the 0.14 quantile by 25,000. Label these quantiles X_α. We then match these N quantiles to their corresponding values from a normal (0,1) distribution. Label these quantiles U_α. Assuming a lognormal household income distribution, X_α and U_α are related as follows:

$$X_\alpha = \exp(\varsigma + U_\alpha \sigma), \tag{1}$$

where ς and σ are the mean and standard deviation parameters characterizing the lognormal distribution (see Johnson and Kotz, 1970, p. 117). These

[4]These data are described at http://www.geolytics.com.

[5]Hardman and Ioannides (2004) express a similar preference for neighborhoods defined at the sub-tract level based on the idea that many interactions are likely to take place within particularly small areas.

[6]For 1980, there are 15 categories: 0–4999, 5000–7499, 7500–9999, 10000–12499, 12500–14999, 15000–17499, 17500–19999, 20000–22499, 22500–24999, 25000–27499, 27500–29999, 30000–34999, 35000–39999, 40000–49999, 50000–74999. For 1990, there are 24 categories: 0–4999, 5000–9999, 10000–12499, 12500–14999, 15000–17499, 17500–19999, 20000–22499, 22500–24999, 25000–27499, 27500–29999, 30000–32499, 32500–34999, 35000–37499, 37500–39999, 40000–42499, 42500–44999, 45000–47499, 47500–49999, 50000–54999, 55000–59999, 60000–74999, 75000–99999, 100000–124499, 125000–149999. For 2000, there are 15 categories: 0–9999, 10000–14999, 15000–19999, 20000–24999, 25000–29999, 30000–34999, 35000–39999, 40000–44999, 45000–49999, 50000–59999, 60000–74999, 75000–99999, 100000–124999, 125000–149999, 150000–199999.

parameters are readily obtained by transforming (1) logarithmically and estimating by OLS. The fit of these regressions tended to be quite high in all cases. Across the 359 metro areas, the mean adjusted R-squared was approximately 0.98 for each year, and the minimum across all metro area–year observations was 0.95. With the standard deviation, σ, the variance follows simply as σ^2.

We consider the following standard decomposition. The variance of log household income in a metropolitan area, σ^2, can be estimated as

$$\sigma^2 = \frac{1}{H}\sum_{n=1}^{N}\sum_{h=1}^{H_n}(y_{h,n} - \bar{y})^2, \tag{2}$$

where $y_{h,n}$ is the log income of household h in neighborhood n, $\bar{y}$ is the mean log household income for the metropolitan area, H_n is the total number of households in neighborhood n, N is the total number of neighborhoods, and H is the total number of households, $\sum_n H_n$.[7] This expression can be re-written as the sum of two terms:

$$\sigma^2 = \frac{1}{H}\sum_{n=1}^{N}\sum_{h=1}^{H_n}(y_{h,n} - \bar{y}_n)^2 + \frac{1}{H}\sum_{n=1}^{N}\sum_{h=1}^{H_n}(\bar{y}_n - \bar{y})^2, \tag{3}$$

where $\bar{y}_n$ represents the mean log household income in neighborhood n. The first of the terms on the right-hand-side of (3) is the "within" neighborhood component, which measures the degree of income dispersion among households residing in the same neighborhood. The second term, the "between" component, captures the amount of income variation across different neighborhoods.

Because we do not have data for individual households, we are unable to compute the within component directly.[8] However, we are able to estimate the between component and the variance, σ^2, which then permits us to form an estimate of within-neighborhood income variation as the difference between the two. This is essentially the same approach Jargowsky (1996) employs. We also generated a pseudo-direct measure of within-neighborhood inequality using the income interval data reported for each block group. To do so, we simply used the same procedure as that outlined above. The results, which are not reported, were very similar to what we do report.[9]

[7]The average numbers of households per metropolitan area are relatively large: 180,164.6 for 1980, 208,780.9 for 1990, 240,407.2 for 2000. Across all three years, the minimum number of households is 8,681. Hence, the difference between using a factor of $\frac{1}{H}$ in (2) instead of $\frac{1}{H-1}$ is extremely small.

[8]Our lack of household-level data also prevents us from calculating the Theil index, which is a widely used metric for quantifying inequality that can be separated into between- and within-group components.

[9]The correlation between the two measures of within-block group income variation was 0.9. The resulting fractions of total income variation due to the within-neighborhood component using this alternative estimation method were very similar to what appears in Table 1: 0.875 in 1980, 0.808 in 1990, and 0.816 in 2000.

4. INEQUALITY PATTERNS

Block Groups

Summary statistics describing overall, within-block group, and between-block group inequality for the 359 U.S. metropolitan areas in the sample appear in Table 1. Two features are immediately apparent. First, the majority of a typical metropolitan area's household income inequality is associated with variation among households living in the same block group. In each year, within-neighborhood inequality accounts for more than three quarters of the total variance in household income. Recall, this finding is qualitatively similar to the results of Ioannides (2004) and Hardman and Ioannides (2004) who find substantial income and wealth heterogeneity among small clusters of housing units. It is also consistent with those of Epple and Sieg (1999), who report that within-municipality inequality can account for roughly 89 percent of the overall income inequality observed in Boston in 1980, and Jargowsky's (1996) results on income segregation across U.S. Census tracts between 1970 and 1990.

Second, income inequality has shown an upward trend over the sample time frame. All three measures (overall income variance, between-neighborhood variation, and within-neighborhood variation) grew between 1980 and 2000, with the majority of this growth taking place during the 1980s. This result, of course, matches the well-documented rise in income disparity in the U.S. over this period.

Here, however, we can see some basic geographic aspects of this rise. In particular, although the increase in overall inequality was associated with an increase in both the extent of dispersion within block groups as well as between

TABLE 1: Summary Statistics—Block Group Income Inequality

Year	Variable	Mean	Standard Deviation	Minimum	Maximum
1980	Variance	0.55	0.06	0.43	0.75
	Within component	0.47	0.05	0.37	0.64
	Between component	0.07	0.04	0.003	0.24
	Within share of variance	0.87	0.06	0.68	0.99
	Between share of variance	0.13	0.06	0.006	0.32
1990	Variance	0.64	0.07	0.48	0.94
	Within component	0.5	0.05	0.39	0.65
	Between component	0.14	0.05	0.04	0.31
	Within share of variance	0.79	0.06	0.61	0.92
	Between share of variance	0.21	0.06	0.08	0.39
2000	Variance	0.65	0.08	0.48	1.05
	Within component	0.52	0.05	0.41	0.7
	Between component	0.13	0.05	0.02	0.38
	Within share of variance	0.8	0.06	0.64	0.95
	Between share of variance	0.2	0.06	0.05	0.36

Note: Statistics taken across 359 metropolitan areas.

them, the majority of the increase in income variance came from the latter. Between 1980 and 2000, the average metro area income variance rose by 10 log points. Nearly 60 percent of this increase can be linked to rising between-neighborhood income differences. Of course, all of this increase came during the 1980s when the extent of income variation between block groups rose by 7 log points.

A similar qualitative result emerges when we compute between-neighborhood income inequality by percentile differences rather than using the decomposition above. To do so, we calculate the 90th, 50th, and 10th percentiles of distribution of (log) average household income among block groups within each metropolitan area, where we weight each block group by its share of the total number of households in the metropolitan area. We then take differences among these three quantiles. Between 1980 and 1990, the average 90–10 difference rose from 0.633 to 0.874, but then declined to 0.867 in 2000. These changes were relatively evenly divided across the top and bottom of the income distribution. The 90–50 and 50–10 gaps both increased by roughly 0.12 during the 1980s, but then dropped slightly during the 1990s.

To gain a better sense of how much the change in a metropolitan area's total income variation can be attributed to each component, we calculated the ratio of the change in a metropolitan area's within-block group inequality over each decade to its corresponding change in total income inequality. Doing so provides an estimate of the fraction of the change in overall inequality associated with each component. The median values across the 359 metro areas in the sample indicate that, during the 1980s, roughly 67 percent of the change in total income inequality can be linked to changes in between-block group income differentials.[10] This finding, recall, is loosely compatible with the evidence surveyed in Section 2 that poverty became more concentrated during the 1980s.

The subsequent decade, however, was very different. Between 1990 and 2000, the vast majority of a typical metropolitan area's change in overall inequality was associated with within-block group changes. Only 27 percent of the change in total income variation within a metro area over this decade can be tied to changing between-block group gaps.

Which metropolitan areas exhibit the highest and lowest levels of inequality? Tables 2–4 list the top and bottom 15 metropolitan areas according to each measure of inequality averaged over the three Census years. Based purely on the decomposition, cities with high levels of either within-neighborhood or between-neighborhood inequality are likely to have high levels of overall inequality, and we see this pattern from some of the overlap in the tables. For example, College Station–Bryan, TX, has high levels of both overall inequality and within-neighborhood inequality; Los Angeles–Long Beach–Santa Ana, CA, has high levels of overall inequality and between-neighborhood inequality.

[10]We report medians instead of means because the resulting shares had a few extreme outliers.

TABLE 2: Metropolitan Areas with Highest and Lowest Overall Inequality

Top 15 Metro Areas	Average Inequality 1980–2000	Bottom 15 Metro Areas	Average Inequality 1980–2000
Bridgeport–Stamford–Norwalk, CT	0.914	Logan, UT–ID	0.513
New York–Northern New Jersey–Long Island, NY–NJ–PA	0.834	Oshkosh–Neenah, WI	0.512
College Station–Bryan, TX	0.786	Monroe, LA	0.512
Gainesville, FL	0.776	Lancaster, PA	0.511
Naples–Marco Island, FL	0.767	Janesville, WI	0.502
Los Angeles–Long Beach–Santa Ana, CA	0.766	York–Hanover, PA	0.501
Auburn–Opelika, AL	0.765	Lebanon, PA	0.494
San Francisco–Oakland–Fremont, CA	0.759	Ogden–Clearfield, UT	0.489
Laredo, TX	0.759	Holland–Grand Haven, MI	0.489
Miami–Ft. Lauderdale–Miami Beach, FL	0.759	Fond du Lac, WI	0.484
McAllen–Edinburg–Mission, TX	0.75	Sheboygan, WI	0.483
New Orleans–Metairie–Kenner, LA	0.747	Appleton, WI	0.481
Athens–Clarke County, GA	0.743	Hinesville–Fort Stewart, GA	0.479
Monroe, LA	0.742	Jacksonville, NC	0.477
Vero Beach, FL	0.737	Warner Robins, GA	0.477

Not surprisingly, the correlations between metropolitan area-level income variance and both the level of within-neighborhood inequality and between-neighborhood inequality are high, respectively 0.77 and 0.8.

Indeed, one might suspect that all three measures of inequality would be strongly correlated, and there are certainly instances in Tables 2–4 that seem to bear out this conclusion. The metro area with the highest average level of household income variation between 1980 and 2000, for instance, Bridgeport–Stamford–Norwalk, CT, also had the highest level of between-neighborhood inequality and the fourth highest level of within-neighborhood inequality. New York–Northern New Jersey–Long Island, NY–NJ–PA, also appears near the top of all three measures of inequality. Conversely, Fond du Lac and Sheboygan, both in Wisconsin, each rank among the metropolitan areas with the lowest inequality levels in terms of all three measures.

However, metropolitan areas with particularly high levels of within-neighborhood income variation are not necessarily the same as those with particularly high levels of between-neighborhood variation. For example, although Morgantown, WV, has a level of within-neighborhood inequality that

TABLE 3: Metropolitan Areas with Highest and Lowest Within-Block Group Inequality

Top 15 Metro Areas	Average Inequality 1980–2000	Bottom 15 Metro Areas	Average Inequality 1980–2000
Santa Cruz–Watsonville, CA	0.619	Springfield, OH	0.436
College Station–Bryan, TX	0.618	Sheboygan, WI	0.436
McAllen–Edinburg–Mission, TX	0.614	Fond du Lac, WI	0.434
Bridgeport–Stamford–Norwalk, CT	0.613	Muskegon–Norton Shores, MI	0.433
Morgantown, WV	0.608	Colorado Springs, CO	0.432
Lafayette, LA	0.594	Salt Lake City, UT	0.432
Athens–Clarke County, GA	0.591	Virginia Beach–Norfolk–Newport News, VA	0.431
Laredo, TX	0.591	Vallejo–Fairfield, CA	0.431
New York–Northern New Jersey–Long Island, NY–NJ–PA	0.591	Columbus, OH	0.431
Brownsville–Harlingen, TX	0.589	York–Hanover, PA	0.428
Ithaca, NY	0.588	Provo–Orem, UT	0.425
Santa Fe, NM	0.588	Fort Wayne, IN	0.423
Greenville, NC	0.587	Jacksonville, NC	0.417
Hattiesburg, MS	0.579	Warner Robins, GA	0.402
Gainesville, FL	0.578	Ogden–Clearfield, UT	0.392

is the fifth highest in the country, its level of between-neighborhood inequality ranks 217th. Memphis, TN–MS–AR, has the fourth highest average level of between-neighborhood inequality, but only ranks 223rd in within-neighborhood income variance. In fact, the correlation between these two types of inequality turns out to be rather modest (although significantly different from zero), 0.24. When looking at 10-year differences in each measure of inequality, the correlation is statistically negligible, –0.004. These findings suggest that the mechanisms underlying the rise of inequality within neighborhoods may not be the same as those underlying the rise of inequality between neighborhoods.

Tracts

Statistics describing tract-based inequality appear in Table 5. Note, because the variance of a metropolitan area's log income distribution does not depend upon how we partition the population geographically, the calculation of σ^2_{mt} for each metro area m in each year t remains as before.

TABLE 4: Metropolitan Areas with Highest and Lowest Between-Block Group Inequality

Top 15 Metro Areas	Average Inequality 1980–2000	Bottom 15 Metro Areas	Average Inequality 1980–2000
Bridgeport–Stamford–Norwalk, CT	0.301	Fond du Lac, WI	0.05
New York–Northern New Jersey–Long Island, NY–NJ–PA	0.243	Hickory-Lenoir-Morgantown, NC	0.049
Naples–Marco Island, FL	0.237	Harrisonburg, VA	0.049
Memphis, TN–AR–MS	0.232	Sheboygan, WI	0.047
Tallahassee, FL	0.223	Punta Gorda, FL	0.047
Auburn–Opelika, AL	0.221	Prescott, AZ	0.046
Midland, TX	0.22	Barnstable Town, MA	0.046
New Orleans–Metairie–Kenner, LA	0.217	Kingston, NY	0.045
Waco, TX	0.209	Appleton, WI	0.044
Los Angeles–Long Beach–Santa Ana, CA	0.208	Elizabethtown, KY	0.043
Vero Beach, FL	0.203	St. George, UT	0.042
Austin–Round Rock, TX	0.199	Glen Falls, NY	0.041
Gainesville, FL	0.198	Monroe, MI	0.036
Savannah, GA	0.198	Dover, DE	0.036
Columbus, GA–AL	0.194	Hinesville-Fort Stewart, GA	0.028

On average, we see the same two qualitative patterns that characterize the block group measures. In each year, the majority of overall income variation can be linked to within-tract income differentials rather than between-tract differentials. At the same time, there was a sizable increase in the extent of between-tract income inequality between 1980 and 1990. Over this decade, the between-tract share of total income inequality rose from 13 percent, on average, to 16 percent.[11]

This rise, of course, is not nearly as striking as that observed for block groups during the 1980s, where the between-neighborhood fraction of overall inequality increased from 13 percent to 21 percent.[12] Given that tracts are composed of multiple block groups, this finding suggests that some of the increase in income segregation across block groups during the 1980s occurred *within*

[11]Once again, we found nearly identical results when computing the within-tract component "directly" using tract-level data on the distribution of household income. The correlation between that measure of within-neighborhood inequality and what we report here across all metropolitan area–year observations is 0.95.

[12]We see a similar result looking at percentile differences. As noted previously, the 90–10 percentile gap (computed as weighted percentiles over block groups) rose between 1980 and 1990 from 0.63 to 0.87 for block groups. For tracts, the rise was much smaller: 0.63 to 0.76.

TABLE 5: Summary Statistics—Tract Income Inequality

Year	Variable	Mean	Standard Deviation	Minimum	Maximum
1980	Variance	0.55	0.06	0.43	0.75
	Within component	0.47	0.05	0.38	0.64
	Between component	0.07	0.04	0.003	0.24
	Within share of variance	0.87	0.06	0.68	0.995
	Between share of variance	0.13	0.06	0.005	0.32
1990	Variance	0.64	0.07	0.48	0.94
	Within component	0.53	0.05	0.41	0.72
	Between component	0.1	0.05	0.02	0.27
	Within share of variance	0.84	0.06	0.68	0.97
	Between share of variance	0.16	0.06	0.03	0.32
2000	Variance	0.65	0.08	0.48	1.05
	Within component	0.55	0.05	0.45	0.74
	Between component	0.09	0.04	0.01	0.34
	Within share of variance	0.86	0.05	0.68	0.98
	Between share of variance	0.14	0.05	0.02	0.32

Note: Statistics taken across 359 metropolitan areas.

Census tracts. In this way, some of the rise in between-block group income differentials does not translate into an increase in between-tract differentials. Therefore, while the majority of the change in a typical metropolitan area's overall income inequality during the 1980s can be linked to increasing differences between block groups (67 percent), only 31 percent can be linked to rising differentials between tracts.[13]

As noted above, we find this difference between the block group- and tract-level results to be especially interesting. If income-related neighborhood spillover effects are more important among relatively small residential areas, such as block groups, than among relatively larger areas, such as tracts, these findings suggest that the rise in segregation during the 1980s may have been more detrimental to low-income households than tract-based estimates have suggested.

Of course, in the decade that followed, the typical metropolitan area saw a modest decline in its inequality between both tracts and block groups, indicating that increases in metropolitan area–level income inequality during the 1990s were associated with rising within-neighborhood differentials. In particular, among the 359 metropolitan areas in the sample, changes in within-tract income inequality accounted for roughly 86 percent of the change in total

[13]Recall, these figures are calculated by taking the ratio of the change in between-neighborhood inequality to the change in overall income variance for each metropolitan area in the sample. These two statistics represent median values across the 359 metropolitan areas.

income inequality, based again on the median of the sample. This figure is roughly similar to the fraction reported above for block groups over this same decade, 73 percent.

Finally, the within- and between-tract inequality measures show a significantly positive, albeit somewhat modest, correlation in levels, 0.21, which is nearly identical to the block-group correlation, 0.24. However, a notable difference between the two geographies emerges when we correlate 10-year *changes* in the two measures. Among block groups, the change in within-neighborhood inequality was essentially uncorrelated with the change in between-neighborhood inequality (–0.004). In the case of Census tracts, the correlation is much larger (and significantly non-zero), 0.28.

We believe that this difference provides further indication that the rise in inequality between 1980 and 2000 involved significant increases in the income differentials between households living in different block groups, even those located within the same tract. Suppose, for example, that some economic shock increases the incomes of households in only certain block groups, while depressing the incomes of households in others. In such a scenario, we would observe large increases in inequality between block groups, but little change in inequality within them, giving rise to a negligible correlation between changes in the two measures. On the other hand, inequality would likely increase both within and between tracts, particularly if block groups in some tracts either gained or lost more than those in others. Hence, there would be a positive association between changes in the two tract-based measures.

5. CONCLUDING COMMENTS

Between 1980 and 2000, the average metropolitan area in the U.S. experienced increases in the extent of income inequality among its resident population. Consistent with previous work, we find that this increase was associated with rising income differentials both within and between neighborhoods, with the majority of the rise in between-neighborhood inequality occurring during the 1980s. Unlike existing studies, however, our block group-level results suggest that the degree of income segregation across neighborhoods rose dramatically over these two decades. While tract-based analyses would suggest that the average level of income variation between neighborhoods increased by less than 30 percent between 1980 and 2000, block group-level results indicate that average between-neighborhood variation nearly doubled over this period.

These results may have implications for the dynamics of inequality, both with respect to what we have seen in recent years and what may be expected to occur in future decades. Because research on neighborhood effects has established the importance of income segregation for reinforcing and perpetuating income dispersion across individuals, these findings suggest that, to the extent that block groups are more relevant than tracts for describing the ranges over which spillovers occur, the residential segregation of households by income may have played a larger role in the rise of overall inequality over the past

two decades than previous work has suggested. Moreover, although the rise of between-neighborhood inequality slowed during the 1990s, the fact that the level of income segregation across block groups nearly doubled between 1980 and 2000 suggests that neighborhood-level influences may serve to widen the income distribution well into the future.

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